Spinning Method

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Claims

1. A method for spinning a multifilament thread from a thermoplastic material comprising the steps of extruding the melted material through a spinneret with a plurality of spinneret holes to form a filament bundle with a plurality of filaments, winding the filaments as thread after solidifying, and cooling the filament bundle in two steps beneath the spinneret, whereby in a first cooling zone the gaseous cooling medium flow is directed in such a way that it flows through the filament bundle transversely, the method being characterized in that the cooling medium leaves the filament bundle practically completely on the side opposite the inflow side, and in a second cooling zone beneath the first cooling zone the filament bundle is cooled further essentially through self-suction of the gaseous cooling medium surrounding the filament bundle.

2. Method according to Claim 1, characterized in that the gaseous cooling medium is sucked away with a suction device after flowing through the thread bundle.

3. Method according to Claim 1 or 2, characterized in that the flow speed of the gaseous cooling medium is between 0.1 and 1 m/s.

4. Method according to one or more of Claims 1 to 3, characterized in that the first cooling zone has a length between 0.2 and 1.2 m.

5. Method according to one or more of Claims 1 to 4, characterized in that the second cooling step is performed by leading the filaments between perforated materials, e.g. perforated panels, in such a way that the gaseous cooling medium can reach the filaments from two sides during the self-suction.

6. Method according to one or more of Claims 1 to 4, characterized in that the second cooling step is performed by leading the filament bundle through a perforated tube.

7. Method according to one or more of Claims 1 to 6, characterized in that the filaments are drawn in a manner known per se after cooling and before being wound up.

8. Method according to one or more of Claims 1 to 7, characterized in that winding is performed at speeds of at least 2000 m/min.

9. Method according to one or more of Claims 1 to 8, characterized in that the gaseous cooling medium is air or an inert gas.

10. Method according to one or more of Claims 1 to 9, characterized in that the thermoplastic material is selected from a group that comprises polyester, polyamide, polyolefin or mixtures of these polymers.

11. Method according to one or more of Claims 1 to 10, characterized in that the thermoplastic material consists essentially of polyethylene terephthalate.

12. Filament yarns, particularly polyester filament yarns, obtainable by a process according to one or more of the preceding Claims 1 to 11.

13. Polyester filament yarns with a breaking tenacity T in mN/tex and an elongation at rupture E in %, the product of the breaking tenacity T and the cube root from the elongation at rupture E, $T*E^{1/3}$, being at least 1600 mN $\%^{1/3}$/tex.

14. Polyester filament yarns according to Claim 12 or 13, for which the sum of their elongation in % after application of a specific load EAST (elongation at specific tension) of 410 mN/tex and their hot-air shrinkage HAS at 180°C in %, thus the sum of EAST + HAS, is less than 11%, preferably less than 10.5%.

15. Cord comprising polyester filament yarns according to one or more of Claims 12 to 14, the cord having a retention capacity Rt in % after dipping, characterized in that the quality factor Q_f, i.e. the product of $T*E^{1/3}$ of the polyester filament yarns and Rt of the cord, is greater than 1350 mN $\%^{1/3}$/tex.